FCC Test Report

Report No.:	RF160913E02C-1
FCC ID:	PY316200342
Test Model:	R6400v2
Series Model:	R6700v3
Received Date:	Sep. 19, 2017
Test Date:	Oct. 05 to 27, 2017
Issued Date:	Nov. 06, 2017
Applicant:	NETGEAR, Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF160913E02C-1	Original release.	Nov. 06, 2017

1 Certificate of Conformity

Product:	AC1750 Smart WiFi Router
Brand:	NETGEAR
Test Model:	R6400v2
Series Model:	R6700v3
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	Oct. 05 to 27, 2017
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Mary Ko , **Date:** Nov. 06, 2017

Mary Ko / Specialist

Approved by : , **Date:** Nov. 06, 2017

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5115MHz, 5150MHz, 5143.5MHz, 5351MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC1750 Smart WiFi Router
Brand	NETGEAR
Test Model	R6400v2
Series Model	R6700v3
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz and 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 24 802.11n (HT40), 802.11ac (VHT40): 11 802.11ac (VHT80): 5
Output Power	**2.4GHz:** 560.898mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 523.594mW **Beamforming Mode:** 583.131mW **5.26GHz ~ 5.32GHz:** **CDD Mode:** 214.883mW **Beamforming Mode:** 215.105mW **5.50GHz ~ 5.70GHz:** **CDD Mode:** 210.489mW **Beamforming Mode:** 224.591mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 913.29mW **Beamforming Mode:** 896.659mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF160913E02-1 and RF160913E02A-1 design is as the following:

◆ Add model: R6700v3, which are identical to each other in all aspects except for the following:

Brand	Model	Description
NETGEAR	R6400v2	for Marketing
	R6700v3	Removed USB 2.0
From the above model, model: **R6400v2** was selected as representative model for the test and its data was recorded in this report.		

◆ Reduce the Heatspreader's size.

Size (mm)	
Original	Newly
226x127	196x90
Note:Both are same materials	

◆ Remove 2 shielding can on bottom PCBA.

2. According to above conditions, only Conducted power and Radiated emissions test items need to be performed. And all data was verified to meet the requirements.
3. Simultaneously transmission condition.

Condition	**Technology**	
1	WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT must be supplied with a power adapter and following different models could be chosen as following table:

No	Brand Name	Model No.	PN	Spec.
1	NETGEAR	2ABL030F 1 NA	332-10758-01	Input: 100-120Vac, 50/60Hz, 1.0A Output: 12Vdc, 2.5A DC output cable (Unshielded, 1.8m)
2	NETGEAR	AD2067F10	332-10797-01	Input: 100-120Vac, 50/60Hz, 1.0A Output: 12Vdc, 2.5A DC output cable (Unshielded, 1.8m)
Note: In the original report, from the above adapters, the radiated emission worse case was found in Adapter 2. Therefore only the test data of the mode was recorded in this report.				

5. The antennas provided to the EUT, please refer to the following table:

Frequency range (MHz)	Directional Antenna Gain (dBi)
2412 ~ 2462	5.65
5180 ~ 5240	5.95
5260 ~ 5320	5.95
5500 ~ 5700	5.98
5745 ~ 5825	5.98

6. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS16~23	3TX	3RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS16~23	3TX	3RX
802.11ac (VHT20)	MCS0~8 Nss=1	3TX	3RX
	MCS0~8 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
802.11ac (VHT40)	MCS0~9 Nss=1	3TX	3RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
802.11ac (VHT80)	MCS0~9 Nss=1	3TX	3RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX

Note:
1. All of modulation mode support beamforming function except 802.11a modulation mode and 2.4GHz band.
2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To			Description
	RE≥1G	RE<1G	APCM	
-	√	√	√	With adapter 2

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

NOTE: In the original report, the EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5500-5700	102 to 134	110	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

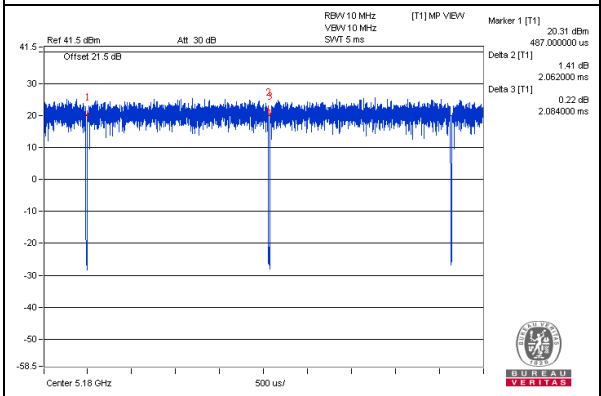
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Rey Chen
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Rey Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

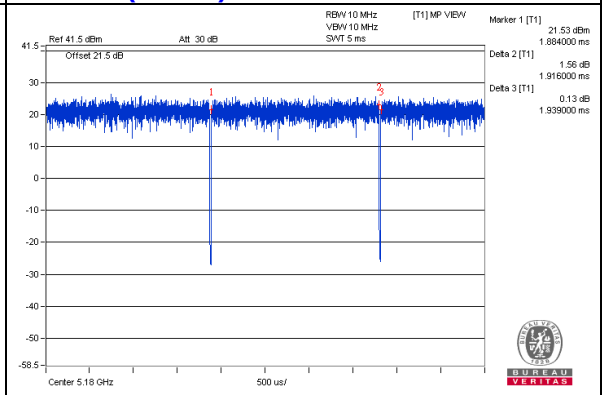
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.062 ms/2.084 ms = 0.989
802.11ac (VHT20): Duty cycle = 1.916 ms/1.939 ms = 0.988
802.11ac (VHT40): Duty cycle = 1.178 ms/1.201 ms = 0.981
802.11ac (VHT80): Duty cycle = 0.459 ms/0.477 ms = 0.962, Duty factor = 10 * log(1/0.962) = 0.17

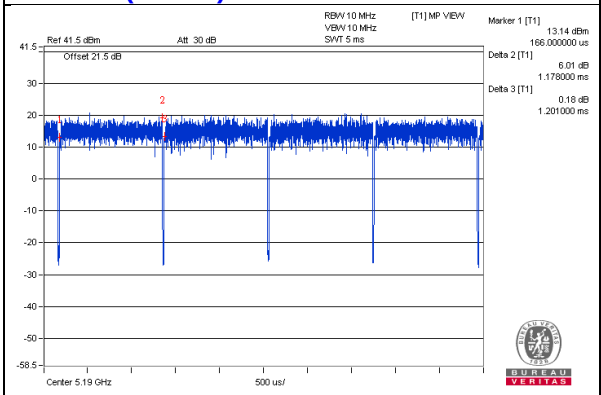
802.11a



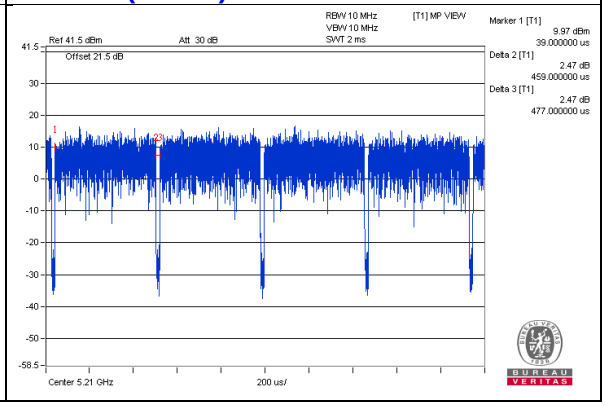
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

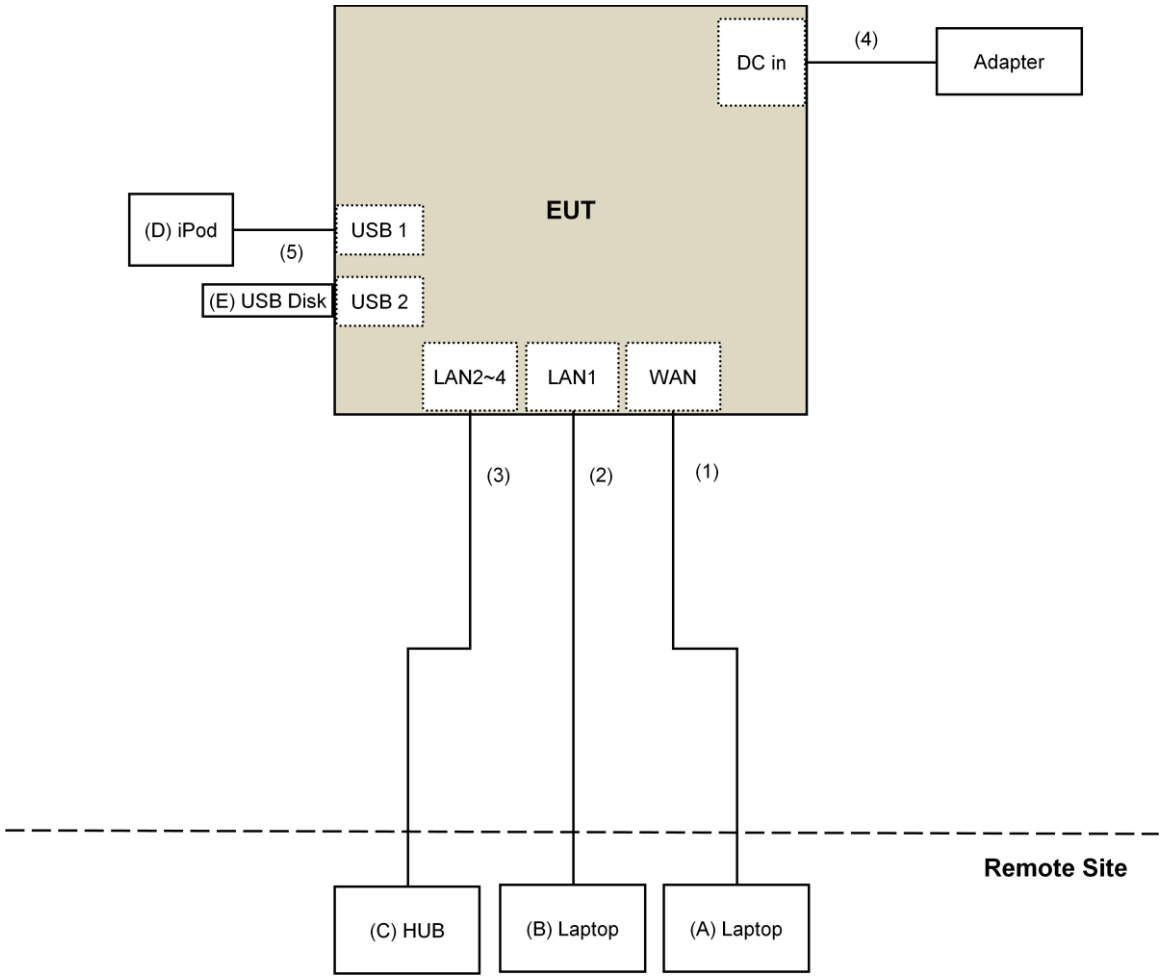
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab
E.	USB Disk	Transcend(16GB)	NA	NA	NA	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	3	10	No	0	Provided by Lab
4.	DC Cable	1	1.8	No	0	Supplied by client
5.	USB Cable	1	0.1	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v01r04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r04</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="4">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$E = \frac{1000000\sqrt{30P}}{3}$ μV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

Below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Designation Number is TW2022.
5. The CANADA Site Registration No. is 20331-1
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Oct. 05, 2017

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Designation Number is TW2022.
5. The CANADA Site Registration No. is 20331-2
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Oct. 27, 2017

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

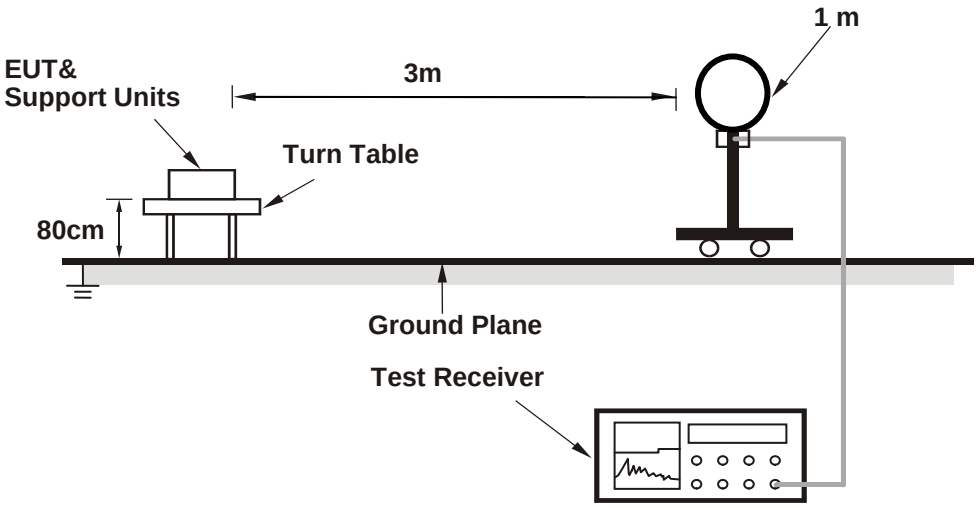
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

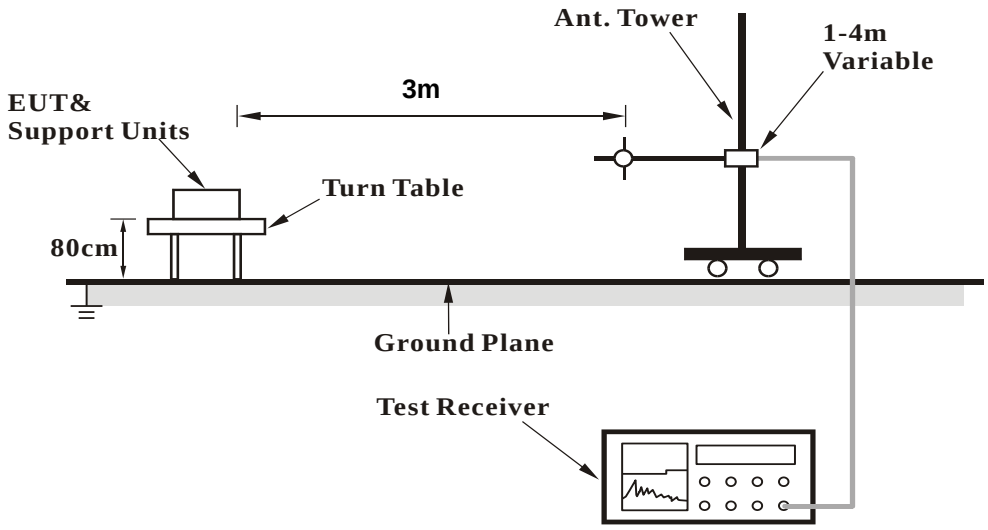
No deviation.

4.1.5 Test Setup

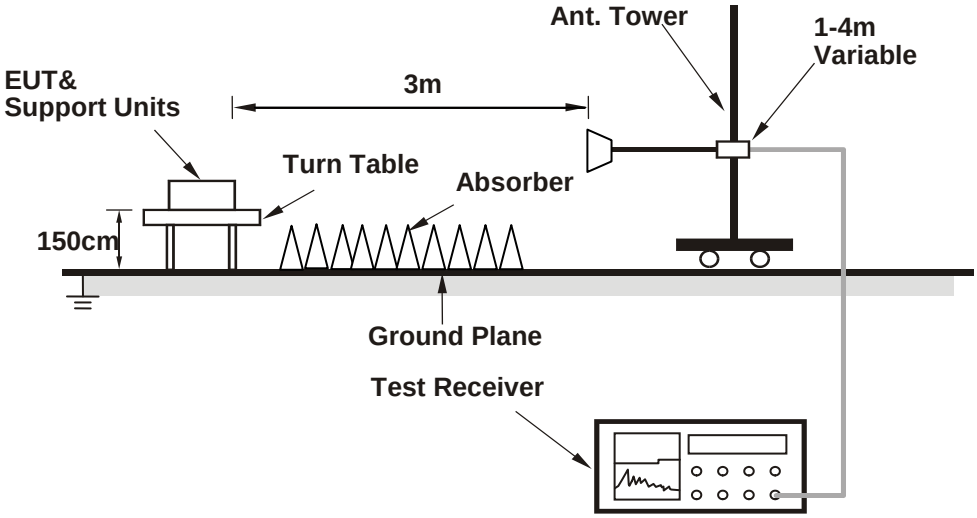
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

a. Connected the EUT with the laptop which is placed on remote site.
b. Contorlling software (Mtool 2.0.1.8.exe) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 36	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	68.5 PK	74.0	-5.5	1.13 H	196	64.5	4.0
2	5150.00	51.4 AV	54.0	-2.6	1.13 H	196	47.4	4.0
3	*5180.00	112.8 PK			1.13 H	196	108.8	4.0
4	*5180.00	102.7 AV			1.13 H	196	98.7	4.0
5	#10360.00	62.4 PK	74.0	-11.6	1.25 H	343	48.8	13.6
6	#10360.00	50.4 AV	54.0	-3.6	1.25 H	343	36.8	13.6
7	15540.00	54.1 PK	74.0	-19.9	1.45 H	195	40.9	13.2
8	15540.00	43.0 AV	54.0	-11.0	1.45 H	195	29.8	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	71.4 PK	74.0	-2.6	1.89 V	173	67.4	4.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.89 V**	**173**	**49.9**	**4.0**
3	*5180.00	118.8 PK			1.89 V	173	114.8	4.0
4	*5180.00	109.3 AV			1.89 V	173	105.3	4.0
5	#10360.00	65.4 PK	74.0	-8.6	2.09 V	19	51.8	13.6
6	#10360.00	52.9 AV	54.0	-1.1	2.09 V	19	39.3	13.6
7	15540.00	53.2 PK	74.0	-20.8	1.98 V	199	40.0	13.2
8	15540.00	40.6 AV	54.0	-13.4	1.98 V	199	27.4	13.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5115.00	59.7 PK	74.0	-14.3	1.06 H	207	55.8	3.9
2	5115.00	51.4 AV	54.0	-2.6	1.06 H	207	47.5	3.9
3	*5200.00	111.6 PK			1.06 H	207	107.6	4.0
4	*5200.00	101.5 AV			1.06 H	207	97.5	4.0
5	5355.00	52.3 PK	74.0	-21.7	1.06 H	207	47.9	4.4
6	5355.00	43.6 AV	54.0	-10.4	1.06 H	207	39.2	4.4
7	#10400.00	62.7 PK	74.0	-11.3	1.33 H	350	49.1	13.6
8	#10400.00	50.8 AV	54.0	-3.2	1.33 H	350	37.2	13.6
9	15600.00	53.7 PK	74.0	-20.3	1.44 H	210	40.3	13.4
10	15600.00	43.0 AV	54.0	-11.0	1.44 H	210	29.6	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5115.00	62.6 PK	74.0	-11.4	1.86 V	173	58.7	3.9
2	**5115.00**	**53.9 AV**	**54.0**	**-0.1**	**1.86 V**	**173**	**50.0**	**3.9**
3	*5200.00	117.6 PK			1.86 V	173	113.6	4.0
4	*5200.00	108.1 AV			1.86 V	173	104.1	4.0
5	5355.00	55.2 PK	74.0	-18.8	1.86 V	174	50.8	4.4
6	5355.00	46.1 AV	54.0	-7.9	1.86 V	174	41.7	4.4
7	#10400.00	65.8 PK	74.0	-8.2	2.12 V	40	52.2	13.6
8	#10400.00	53.0 AV	54.0	-1.0	2.12 V	40	39.4	13.6
9	15600.00	52.6 PK	74.0	-21.4	1.99 V	200	39.2	13.4
10	15600.00	40.3 AV	54.0	-13.7	1.99 V	200	26.9	13.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.9 PK			1.05 H	207	112.7	4.2
2	*5240.00	106.0 AV			1.05 H	207	101.8	4.2
3	5398.00	55.4 PK	74.0	-18.6	1.05 H	207	51.0	4.4
4	5398.00	46.4 AV	54.0	-7.6	1.05 H	207	42.0	4.4
5	#10480.00	62.8 PK	74.0	-11.2	1.27 H	360	49.1	13.7
6	#10480.00	50.3 AV	54.0	-3.7	1.27 H	360	36.6	13.7
7	15720.00	53.8 PK	74.0	-20.2	1.49 H	196	39.8	14.0
8	15720.00	43.0 AV	54.0	-11.0	1.49 H	196	29.0	14.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	122.9 PK			1.89 V	193	118.7	4.2
2	*5240.00	112.6 AV			1.89 V	193	108.4	4.2
3	5398.00	58.3 PK	74.0	-15.7	1.89 V	193	53.9	4.4
4	5398.00	48.9 AV	54.0	-5.1	1.89 V	193	44.5	4.4
5	#10480.00	65.8 PK	74.0	-8.2	2.09 V	40	52.1	13.7
6	#10480.00	53.4 AV	54.0	-0.6	2.09 V	40	39.7	13.7
7	15720.00	53.4 PK	74.0	-20.6	2.06 V	205	39.4	14.0
8	15720.00	41.1 AV	54.0	-12.9	2.06 V	205	27.1	14.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5046.00	54.1 PK	74.0	-19.9	1.04 H	187	50.2	3.9
2	5046.00	46.1 AV	54.0	-7.9	1.04 H	187	42.2	3.9
3	*5260.00	112.3 PK			1.04 H	187	108.1	4.2
4	*5260.00	101.4 AV			1.04 H	187	97.2	4.2
5	5415.00	51.3 PK	74.0	-22.7	1.04 H	187	46.9	4.4
6	5415.00	41.4 AV	54.0	-12.6	1.04 H	187	37.0	4.4
7	#10520.00	62.8 PK	74.0	-11.2	1.29 H	360	49.0	13.8
8	#10520.00	50.7 AV	54.0	-3.3	1.29 H	360	36.9	13.8
9	15780.00	53.7 PK	74.0	-20.3	1.39 H	190	39.6	14.1
10	15780.00	42.9 AV	54.0	-11.1	1.39 H	190	28.8	14.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5046.00	57.0 PK	74.0	-17.0	1.77 V	173	53.1	3.9
2	5046.00	48.6 AV	54.0	-5.4	1.77 V	173	44.7	3.9
3	*5260.00	118.3 PK			1.77 V	173	114.1	4.2
4	*5260.00	108.0 AV			1.77 V	173	103.8	4.2
5	5415.00	54.2 PK	74.0	-19.8	1.77 V	173	49.8	4.4
6	5415.00	43.9 AV	54.0	-10.1	1.77 V	173	39.5	4.4
7	#10520.00	66.0 PK	74.0	-8.0	2.10 V	29	52.2	13.8
8	#10520.00	53.6 AV	54.0	-0.4	2.10 V	29	39.8	13.8
9	15780.00	52.8 PK	74.0	-21.2	2.02 V	219	38.7	14.1
10	15780.00	40.7 AV	54.0	-13.3	2.02 V	219	26.6	14.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5077.00	56.3 PK	74.0	-17.7	1.06 H	195	52.4	3.9
2	5077.00	46.5 AV	54.0	-7.5	1.06 H	195	42.6	3.9
3	*5300.00	112.3 PK			1.06 H	195	108.0	4.3
4	*5300.00	101.4 AV			1.06 H	195	97.1	4.3
5	5378.00	58.8 PK	74.0	-15.2	1.06 H	195	54.4	4.4
6	5378.00	49.8 AV	54.0	-4.2	1.06 H	195	45.4	4.4
7	10600.00	62.3 PK	74.0	-11.7	1.25 H	360	48.5	13.8
8	10600.00	50.3 AV	54.0	-3.7	1.25 H	360	36.5	13.8
9	15900.00	53.4 PK	74.0	-20.6	1.46 H	194	40.2	13.2
10	15900.00	42.5 AV	54.0	-11.5	1.46 H	194	29.3	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5077.00	59.2 PK	74.0	-14.8	1.79 V	184	55.3	3.9
2	5077.00	49.0 AV	54.0	-5.0	1.79 V	184	45.1	3.9
3	*5300.00	118.3 PK			1.79 V	184	114.0	4.3
4	*5300.00	108.0 AV			1.79 V	184	103.7	4.3
5	5378.00	61.7 PK	74.0	-12.3	1.79 V	184	57.3	4.4
6	5378.00	52.3 AV	54.0	-1.7	1.79 V	184	47.9	4.4
7	10600.00	65.7 PK	74.0	-8.3	2.06 V	47	51.9	13.8
8	10600.00	53.0 AV	54.0	-1.0	2.06 V	47	39.2	13.8
9	15900.00	53.0 PK	74.0	-21.0	2.04 V	207	39.8	13.2
10	15900.00	40.6 AV	54.0	-13.4	2.04 V	207	27.4	13.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.8 PK			1.02 H	198	107.5	4.3
2	*5320.00	100.9 AV			1.02 H	198	96.6	4.3
3	5395.00	62.7 PK	74.0	-11.3	1.02 H	198	58.3	4.4
4	5395.00	48.8 AV	54.0	-5.2	1.02 H	198	44.4	4.4
5	10640.00	62.3 PK	74.0	-11.7	1.23 H	345	48.3	14.0
6	10640.00	50.3 AV	54.0	-3.7	1.23 H	345	36.3	14.0
7	15960.00	53.7 PK	74.0	-20.3	1.44 H	214	40.2	13.5
8	15960.00	43.0 AV	54.0	-11.0	1.44 H	214	29.5	13.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	117.8 PK			1.76 V	173	113.5	4.3
2	*5320.00	107.5 AV			1.76 V	173	103.2	4.3
3	5395.00	65.6 PK	74.0	-8.4	1.76 V	173	61.2	4.4
4	5395.00	51.3 AV	54.0	-2.7	1.76 V	173	46.9	4.4
5	10640.00	65.8 PK	74.0	-8.2	2.05 V	39	51.8	14.0
6	10640.00	53.3 AV	54.0	-0.7	2.05 V	39	39.3	14.0
7	15960.00	53.2 PK	74.0	-20.8	2.00 V	208	39.7	13.5
8	15960.00	40.7 AV	54.0	-13.3	2.00 V	208	27.2	13.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5041.00	50.7 PK	74.0	-23.3	1.12 H	209	46.8	3.9
2	5041.00	41.8 AV	54.0	-12.2	1.12 H	209	37.9	3.9
3	#5470.00	68.3 PK	74.0	-5.7	1.12 H	209	63.8	4.5
4	#5470.00	44.5 AV	54.0	-9.5	1.12 H	209	40.0	4.5
5	*5500.00	110.3 PK			1.12 H	209	105.8	4.5
6	*5500.00	98.7 AV			1.12 H	209	94.2	4.5
7	#5729.00	54.7 PK	74.0	-19.3	1.12 H	209	49.8	4.9
8	#5729.00	46.3 AV	54.0	-7.7	1.12 H	209	41.4	4.9
9	11000.00	62.7 PK	74.0	-11.3	1.28 H	355	47.9	14.8
10	11000.00	50.4 AV	54.0	-3.6	1.28 H	355	35.6	14.8
11	#16500.00	54.0 PK	74.0	-20.0	1.41 H	217	38.4	15.6
12	#16500.00	42.9 AV	54.0	-11.1	1.41 H	217	27.3	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5041.00	53.6 PK	74.0	-20.4	1.65 V	180	49.7	3.9
2	5041.00	44.3 AV	54.0	-9.7	1.65 V	180	40.4	3.9
3	#5470.00	71.2 PK	74.0	-2.8	1.67 V	185	66.7	4.5
4	#5470.00	47.0 AV	54.0	-7.0	1.67 V	185	42.5	4.5
5	*5500.00	116.3 PK			1.67 V	185	111.8	4.5
6	*5500.00	105.3 AV			1.67 V	185	100.8	4.5
7	#5729.00	57.6 PK	74.0	-16.4	1.67 V	185	52.7	4.9
8	#5729.00	48.8 AV	54.0	-5.2	1.67 V	185	43.9	4.9
9	11000.00	65.7 PK	74.0	-8.3	2.13 V	37	50.9	14.8
10	11000.00	53.3 AV	54.0	-0.7	2.13 V	37	38.5	14.8
11	#16500.00	53.2 PK	74.0	-20.8	2.04 V	222	37.6	15.6
12	#16500.00	41.1 AV	54.0	-12.9	2.04 V	222	25.5	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5418.00	52.5 PK	74.0	-21.5	1.09 H	194	48.0	4.5
2	5418.00	42.4 AV	54.0	-11.6	1.09 H	194	37.9	4.5
3	*5580.00	109.3 PK			1.09 H	194	104.7	4.6
4	*5580.00	98.4 AV			1.09 H	194	93.8	4.6
5	#5818.00	53.9 PK	74.0	-20.1	1.09 H	194	48.7	5.2
6	#5818.00	45.0 AV	54.0	-9.0	1.09 H	194	39.8	5.2
7	11160.00	62.7 PK	74.0	-11.3	1.30 H	360	48.3	14.4
8	11160.00	50.5 AV	54.0	-3.5	1.30 H	360	36.1	14.4
9	#16740.00	54.2 PK	74.0	-19.8	1.48 H	206	37.7	16.5
10	#16740.00	43.1 AV	54.0	-10.9	1.48 H	206	26.6	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5418.00	55.4 PK	74.0	-18.6	1.68 V	188	50.9	4.5
2	5418.00	44.9 AV	54.0	-9.1	1.68 V	188	40.4	4.5
3	*5580.00	115.3 PK			1.68 V	188	110.7	4.6
4	*5580.00	105.0 AV			1.68 V	188	100.4	4.6
5	#5818.00	56.8 PK	74.0	-17.2	1.68 V	188	51.6	5.2
6	#5818.00	47.5 AV	54.0	-6.5	1.68 V	188	42.3	5.2
7	11160.00	65.5 PK	74.0	-8.5	2.08 V	34	51.1	14.4
8	11160.00	52.8 AV	54.0	-1.2	2.08 V	34	38.4	14.4
9	#16740.00	53.4 PK	74.0	-20.6	1.98 V	202	36.9	16.5
10	#16740.00	41.2 AV	54.0	-12.8	1.98 V	202	24.7	16.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	108.9 PK			1.11 H	200	104.1	4.8
2	*5700.00	98.8 AV			1.11 H	200	94.0	4.8
3	#5778.00	61.5 PK	74.0	-12.5	1.11 H	200	56.5	5.0
4	#5778.00	51.1 AV	54.0	-2.9	1.11 H	200	46.1	5.0
5	11400.00	62.3 PK	74.0	-11.7	1.24 H	342	47.9	14.4
6	11400.00	50.4 AV	54.0	-3.6	1.24 H	342	36.0	14.4
7	#17100.00	54.0 PK	74.0	-20.0	1.48 H	200	35.5	18.5
8	#17100.00	43.1 AV	54.0	-10.9	1.48 H	200	24.6	18.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.9 PK			1.67 V	188	110.1	4.8
2	*5700.00	105.4 AV			1.67 V	188	100.6	4.8
3	#5778.00	64.4 PK	74.0	-9.6	1.67 V	188	59.4	5.0
4	#5778.00	53.6 AV	54.0	-0.4	1.67 V	188	48.6	5.0
5	11400.00	65.6 PK	74.0	-8.4	2.15 V	31	51.2	14.4
6	11400.00	53.2 AV	54.0	-0.8	2.15 V	31	38.8	14.4
7	#17100.00	53.5 PK	74.0	-20.5	2.07 V	206	35.0	18.5
8	#17100.00	41.0 AV	54.0	-13.0	2.07 V	206	22.5	18.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	114.9 PK			1.07 H	188	109.9	5.0
2	*5745.00	105.0 AV			1.07 H	188	100.0	5.0
3	11490.00	62.8 PK	74.0	-11.2	1.27 H	356	48.7	14.1
4	11490.00	50.6 AV	54.0	-3.4	1.27 H	356	36.5	14.1
5	#17235.00	53.7 PK	74.0	-20.3	1.43 H	204	35.4	18.3
6	#17235.00	42.8 AV	54.0	-11.2	1.43 H	204	24.5	18.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	120.9 PK			1.53 V	140	115.9	5.0
2	*5745.00	111.6 AV			1.53 V	140	106.6	5.0
3	11490.00	65.7 PK	74.0	-8.3	2.09 V	31	51.6	14.1
4	11490.00	53.1 AV	54.0	-0.9	2.09 V	31	39.0	14.1
5	#17235.00	53.1 PK	74.0	-20.9	2.01 V	214	34.8	18.3
6	#17235.00	40.8 AV	54.0	-13.2	2.01 V	214	22.5	18.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	114.9 PK			1.12 H	173	109.9	5.0
2	*5785.00	104.8 AV			1.12 H	173	99.8	5.0
3	11570.00	62.4 PK	74.0	-11.6	1.25 H	353	48.4	14.0
4	11570.00	50.3 AV	54.0	-3.7	1.25 H	353	36.3	14.0
5	#17355.00	54.3 PK	74.0	-19.7	1.41 H	207	35.4	18.9
6	#17355.00	43.2 AV	54.0	-10.8	1.41 H	207	24.3	18.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.4 PK			1.50 V	142	115.4	5.0
2	*5785.00	111.1 AV			1.50 V	142	106.1	5.0
3	11570.00	66.2 PK	74.0	-7.8	2.07 V	39	52.2	14.0
4	11570.00	53.2 AV	54.0	-0.8	2.07 V	39	39.2	14.0
5	#17355.00	53.6 PK	74.0	-20.4	2.06 V	217	34.7	18.9
6	#17355.00	41.1 AV	54.0	-12.9	2.06 V	217	22.2	18.9

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.7 PK			1.04 H	186	109.5	5.2
2	*5825.00	104.9 AV			1.04 H	186	99.7	5.2
3	11650.00	62.8 PK	74.0	-11.2	1.26 H	351	48.7	14.1
4	11650.00	50.5 AV	54.0	-3.5	1.26 H	351	36.4	14.1
5	#17475.00	53.5 PK	74.0	-20.5	1.48 H	200	33.8	19.7
6	#17475.00	42.5 AV	54.0	-11.5	1.48 H	200	22.8	19.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	121.1 PK			1.54 V	125	115.9	5.2
2	*5825.00	112.0 AV			1.54 V	125	106.8	5.2
3	11650.00	65.8 PK	74.0	-8.2	2.11 V	27	51.7	14.1
4	11650.00	53.2 AV	54.0	-0.8	2.11 V	27	39.1	14.1
5	#17475.00	52.8 PK	74.0	-21.2	2.07 V	221	33.1	19.7
6	#17475.00	40.4 AV	54.0	-13.6	2.07 V	221	20.7	19.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.50	66.1 PK	74.0	-7.9	1.10 H	165	62.1	4.0
2	5143.50	51.2 AV	54.0	-2.8	1.10 H	165	47.2	4.0
3	*5210.00	101.1 PK			1.10 H	165	97.0	4.1
4	*5210.00	88.8 AV			1.10 H	165	84.7	4.1
5	5360.50	55.8 PK	74.0	-18.2	1.10 H	165	51.4	4.4
6	5360.50	46.7 AV	54.0	-7.3	1.10 H	165	42.3	4.4
7	#10420.00	63.4 PK	74.0	-10.6	1.21 H	343	49.8	13.6
8	#10420.00	50.9 AV	54.0	-3.1	1.21 H	343	37.3	13.6
9	15630.00	53.6 PK	74.0	-20.4	1.42 H	194	40.0	13.6
10	15630.00	42.4 AV	54.0	-11.6	1.42 H	194	28.8	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.50	69.1 PK	74.0	-4.9	1.78 V	141	65.1	4.0
2	**5143.50**	**53.9 AV**	**54.0**	**-0.1**	**1.78 V**	**141**	**49.9**	**4.0**
3	*5210.00	106.6 PK			1.78 V	141	102.5	4.1
4	*5210.00	95.3 AV			1.78 V	141	91.2	4.1
5	5360.50	55.1 PK	74.0	-18.9	1.78 V	141	50.7	4.4
6	5360.50	44.6 AV	54.0	-9.4	1.78 V	141	40.2	4.4
7	#10420.00	65.6 PK	74.0	-8.4	2.14 V	23	52.0	13.6
8	#10420.00	52.9 AV	54.0	-1.1	2.14 V	23	39.3	13.6
9	15630.00	53.1 PK	74.0	-20.9	2.03 V	209	39.5	13.6
10	15630.00	40.6 AV	54.0	-13.4	2.03 V	209	27.0	13.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.60	49.0 PK	74.0	-25.0	1.10 H	177	45.0	4.0
2	5143.60	38.7 AV	54.0	-15.3	1.10 H	177	34.7	4.0
3	*5290.00	103.0 PK			1.10 H	177	98.7	4.3
4	*5290.00	89.5 AV			1.10 H	177	85.2	4.3
5	5351.00	70.8 PK	74.0	-3.2	1.10 H	177	66.4	4.4
6	5351.00	53.8 AV	54.0	-0.2	1.10 H	177	49.4	4.4
7	#10580.00	53.1 PK	74.0	-20.9	1.30 H	350	39.2	13.9
8	#10580.00	41.0 AV	54.0	-13.0	1.30 H	350	27.1	13.9
9	15870.00	54.1 PK	74.0	-19.9	1.49 H	211	40.7	13.4
10	15870.00	42.9 AV	54.0	-11.1	1.49 H	211	29.5	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.60	52.0 PK	74.0	-22.0	1.81 V	137	48.0	4.0
2	5143.60	41.4 AV	54.0	-12.6	1.81 V	137	37.4	4.0
3	*5290.00	108.5 PK			1.81 V	137	104.2	4.3
4	*5290.00	96.0 AV			1.81 V	137	91.7	4.3
5	5351.00	70.9 PK	74.0	-3.1	1.81 V	137	66.5	4.4
6	**5351.00**	**53.9 AV**	**54.0**	**-0.1**	**1.81 V**	**137**	**49.5**	**4.4**
7	#10580.00	56.2 PK	74.0	-17.8	2.15 V	42	42.3	13.9
8	#10580.00	43.7 AV	54.0	-10.3	2.15 V	42	29.8	13.9
9	15870.00	52.8 PK	74.0	-21.2	2.01 V	230	39.4	13.4
10	15870.00	40.6 AV	54.0	-13.4	2.01 V	230	27.2	13.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5463.00	65.8 PK	74.0	-8.2	1.13 H	177	61.3	4.5
2	#5463.00	51.1 AV	54.0	-2.9	1.13 H	177	46.6	4.5
3	*5530.00	104.5 PK			1.13 H	177	100.0	4.5
4	*5530.00	92.2 AV			1.13 H	177	87.7	4.5
5	#5726.00	56.2 PK	74.0	-17.8	1.13 H	177	51.3	4.9
6	#5726.00	47.3 AV	54.0	-6.7	1.13 H	177	42.4	4.9
7	11060.00	53.5 PK	74.0	-20.5	1.26 H	358	39.0	14.5
8	11060.00	41.0 AV	54.0	-13.0	1.26 H	358	26.5	14.5
9	#16590.00	53.4 PK	74.0	-20.6	1.44 H	205	36.8	16.6
10	#16590.00	42.3 AV	54.0	-11.7	1.44 H	205	25.7	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5463.00	68.8 PK	74.0	-5.2	3.40 V	152	64.3	4.5
2	#5463.00	53.8 AV	54.0	-0.2	3.40 V	152	49.3	4.5
3	*5530.00	110.0 PK			3.40 V	152	105.5	4.5
4	*5530.00	98.7 AV			3.40 V	152	94.2	4.5
5	#5726.00	55.5 PK	74.0	-18.5	3.40 V	152	50.6	4.9
6	#5726.00	45.2 AV	54.0	-8.8	3.40 V	152	40.3	4.9
7	11060.00	55.6 PK	74.0	-18.4	2.10 V	13	41.1	14.5
8	11060.00	42.9 AV	54.0	-11.1	2.10 V	13	28.4	14.5
9	#16590.00	52.8 PK	74.0	-21.2	2.05 V	225	36.2	16.6
10	#16590.00	40.6 AV	54.0	-13.4	2.05 V	225	24.0	16.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 122	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5467.00	57.6 PK	74.0	-16.4	1.16 H	173	53.1	4.5
2	#5467.00	48.1 AV	54.0	-5.9	1.16 H	173	43.6	4.5
3	*5610.00	103.6 PK			1.16 H	173	98.9	4.7
4	*5610.00	94.3 AV			1.16 H	173	89.6	4.7
5	#5725.00	56.7 PK	74.0	-17.3	1.16 H	173	51.8	4.9
6	#5725.00	47.0 AV	54.0	-7.0	1.16 H	173	42.1	4.9
7	11220.00	52.5 PK	74.0	-21.5	1.27 H	359	38.1	14.4
8	11220.00	40.1 AV	54.0	-13.9	1.27 H	359	25.7	14.4
9	#16830.00	54.1 PK	74.0	-19.9	1.53 H	198	37.1	17.0
10	#16830.00	43.0 AV	54.0	-11.0	1.53 H	198	26.0	17.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5467.00	56.9 PK	74.0	-17.1	3.32 V	155	52.4	4.5
2	#5467.00	46.0 AV	54.0	-8.0	3.32 V	155	41.5	4.5
3	*5610.00	109.1 PK			3.32 V	155	104.4	4.7
4	*5610.00	100.8 AV			3.32 V	155	96.1	4.7
5	#5725.00	59.7 PK	74.0	-14.3	3.32 V	155	54.8	4.9
6	#5725.00	49.7 AV	54.0	-4.3	3.32 V	155	44.8	4.9
7	11220.00	55.9 PK	74.0	-18.1	2.11 V	22	41.5	14.4
8	11220.00	43.4 AV	54.0	-10.6	2.11 V	22	29.0	14.4
9	#16830.00	52.8 PK	74.0	-21.2	2.12 V	226	35.8	17.0
10	#16830.00	40.5 AV	54.0	-13.5	2.12 V	226	23.5	17.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	106.3 PK			1.06 H	176	101.3	5.0
2	*5775.00	96.8 AV			1.06 H	176	91.8	5.0
3	11550.00	53.0 PK	74.0	-21.0	1.24 H	352	39.0	14.0
4	11550.00	40.4 AV	54.0	-13.6	1.24 H	352	26.4	14.0
5	#17325.00	53.8 PK	74.0	-20.2	1.46 H	205	35.2	18.6
6	#17325.00	42.8 AV	54.0	-11.2	1.46 H	205	24.2	18.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	111.8 PK			2.54 V	134	106.8	5.0
2	*5775.00	103.3 AV			2.54 V	134	98.3	5.0
3	11550.00	56.0 PK	74.0	-18.0	2.12 V	31	42.0	14.0
4	11550.00	43.3 AV	54.0	-10.7	2.12 V	31	29.3	14.0
5	#17325.00	52.8 PK	74.0	-21.2	2.02 V	235	34.2	18.6
6	#17325.00	40.5 AV	54.0	-13.5	2.02 V	235	21.9	18.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 110	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	113.08	36.7 QP	43.5	-6.8	2.00 H	319	47.5	-10.8
2	139.27	34.9 QP	43.5	-8.6	2.00 H	84	43.5	-8.6
3	207.56	33.4 QP	43.5	-10.1	1.50 H	153	45.0	-11.6
4	391.20	38.1 QP	46.0	-7.9	2.00 H	314	43.7	-5.6
5	412.16	37.0 QP	46.0	-9.0	2.00 H	311	42.0	-5.0
6	438.76	35.0 QP	46.0	-11.0	2.00 H	301	38.9	-3.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	45.20	36.7 QP	40.0	-3.3	1.00 V	180	45.0	-8.3
2	106.73	34.8 QP	43.5	-8.7	1.00 V	220	46.2	-11.4
3	357.25	40.1 QP	46.0	-5.9	1.00 V	303	46.4	-6.3
4	380.15	42.2 QP	46.0	-3.8	1.00 V	255	48.0	-5.8
5	425.61	37.3 QP	46.0	-8.7	1.00 V	258	41.7	-4.4
6	492.93	38.6 QP	46.0	-7.4	1.00 V	258	41.9	-3.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Transmit Power Measurment

4.2.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Client device	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.2.2 Test Setup

4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.2.7 Test Result

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	19.12	18.73	20.10	258.632	24.13	30.00	Pass
40	5200	18.49	17.89	19.60	223.351	23.49	30.00	Pass
48	5240	21.80	21.86	23.40	523.594	27.19	30.00	Pass
52	5260	18.34	18.39	18.90	214.883	23.32	24.00	Pass
60	5300	18.37	18.36	18.76	212.418	23.27	24.00	Pass
64	5320	18.41	18.33	18.62	210.198	23.23	24.00	Pass
100	5500	18.35	18.36	18.64	210.054	23.22	24.00	Pass
116	5580	18.22	18.70	18.45	210.489	23.23	24.00	Pass
140	5700	18.32	18.69	18.33	209.958	23.22	24.00	Pass
149	5745	24.69	24.69	24.82	892.273	29.50	30.00	Pass
157	5785	24.68	24.86	24.96	913.29	29.61	30.00	Pass
165	5825	24.69	24.66	24.79	888.158	29.48	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	20.07	19.77	21.21	328.597	25.17	30.00	Pass
40	5200	18.55	18.53	20.37	251.792	24.01	30.00	Pass
48	5240	22.70	22.52	23.39	583.131	27.66	30.00	Pass
52	5260	18.33	18.38	18.93	215.105	23.33	24.00	Pass
60	5300	18.38	18.36	18.77	212.75	23.28	24.00	Pass
64	5320	18.39	18.32	18.65	210.226	23.23	24.00	Pass
100	5500	18.28	18.46	18.66	210.895	23.24	24.00	Pass
116	5580	18.28	18.69	18.52	212.38	23.27	24.00	Pass
140	5700	18.40	18.66	18.32	210.554	23.23	24.00	Pass
149	5745	24.65	24.60	24.70	875.267	29.42	30.00	Pass
157	5785	24.60	24.76	24.90	896.659	29.53	30.00	Pass
165	5825	24.59	24.63	24.72	874.625	29.42	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	17.12	16.69	17.91	159.991	22.04	30.00	Pass
46	5230	21.59	21.23	22.46	453.149	26.56	30.00	Pass
54	5270	18.22	18.11	18.84	207.648	23.17	24.00	Pass
62	5310	17.77	17.75	18.23	185.934	22.69	24.00	Pass
102	5510	16.92	17.33	17.44	158.742	22.01	24.00	Pass
110	5550	18.33	18.98	18.89	224.591	23.51	24.00	Pass
134	5670	18.54	18.83	18.36	216.383	23.35	24.00	Pass
151	5755	24.42	24.22	24.38	815.092	29.11	30.00	Pass
159	5795	24.53	24.50	24.60	854.033	29.31	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	42	17.07	17.68	16.70	156.321	21.94	30.00	Pass
58	58	17.71	17.93	17.83	181.781	22.60	24.00	Pass
106	106	17.51	17.91	17.80	178.422	22.51	24.00	Pass
122	122	18.22	18.80	18.44	212.055	23.26	24.00	Pass
155	155	21.75	21.99	22.35	479.54	26.81	30.00	Pass

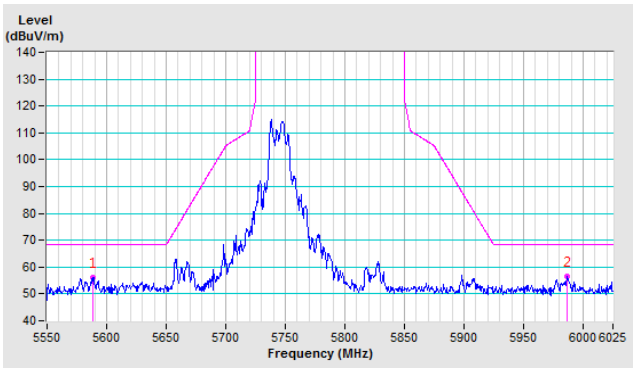
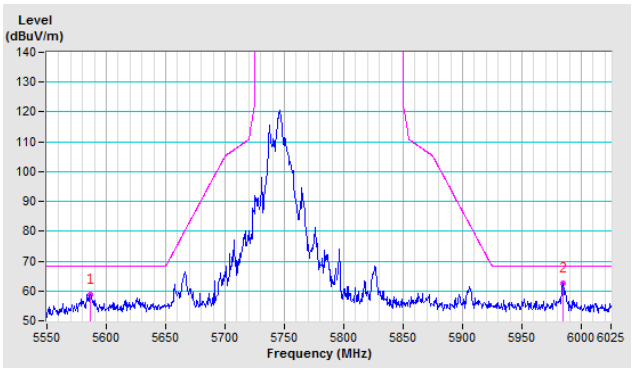
5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

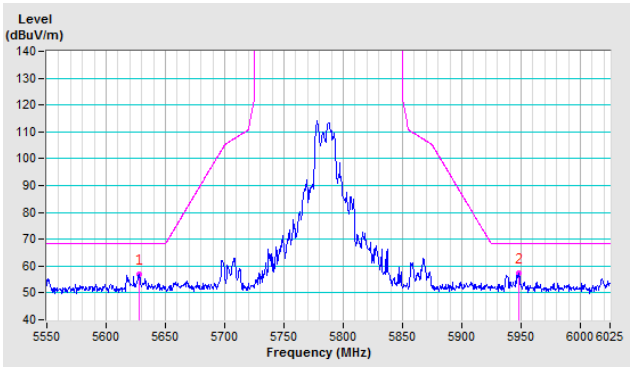
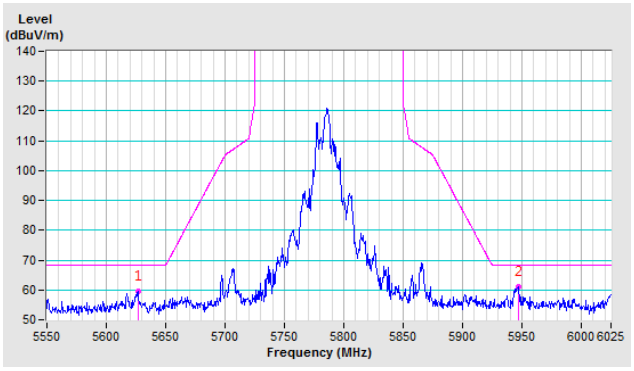
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11ac (VHT20)

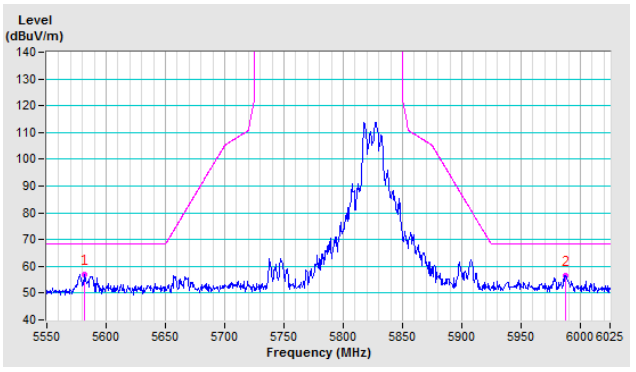
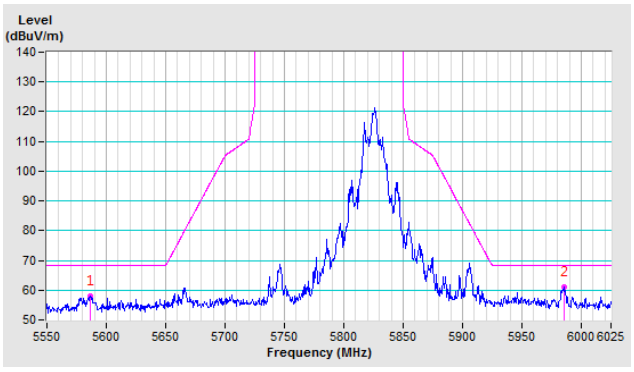
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

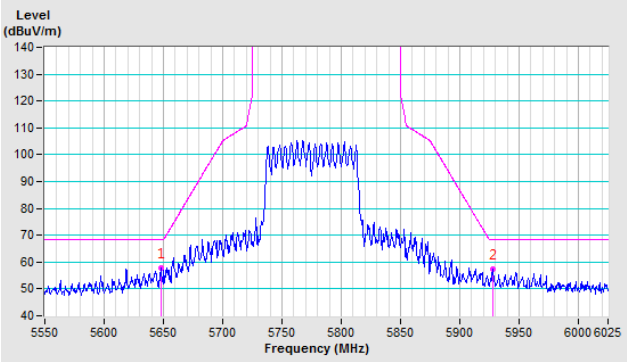
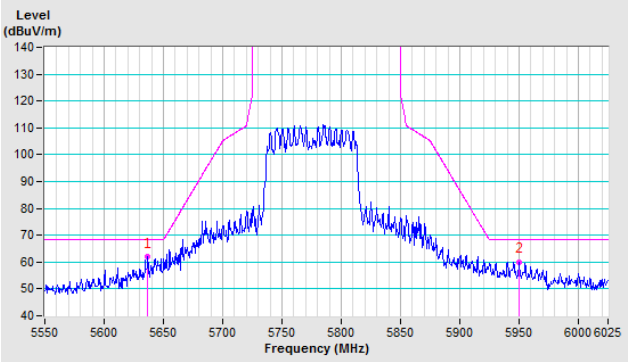
Horizontal	Vertical
	

CH 165 5825 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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